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# Business and State in the development of the steel industry in Spain and Italy (c.1880–1929)

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## ABSTRACT

In the mid-nineteenth century, the Spanish and Italian steel industries were significantly less developed than those of the more advanced countries in Europe. From the mid-1880s, heavy industry in these two countries experienced considerable growth, particularly the steel sector, due to two very different strategies. In the case of Italy, state intervention was so frequent and significant that it has even been referred to as an early state capitalism. In Spain, on the other hand, the sector's development was based principally on the private initiative. This article seeks to shed light on the interaction between government institutions and business organisations in the implementation of the development strategies of the two countries.

## KEYWORDS

AQ1

## Introduction

In Spain and Italy the causes of the economic backwardness in the nineteenth and early twentieth centuries constitute one of the principle topics of study in business history. Although many factors have been considered to explain the poor economic performance of these two Mediterranean countries in the second half of the nineteenth century and early twentieth century, the lack of entrepreneurship constitutes the most general explanation for their backwardness. Moreover, this absence of entrepreneurship has been related to the role played by the State in the industrialisation process in the final decades of the nineteenth century.

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It is generally accepted that the countries with a delayed development required extensive resource mobilisation to catch up with the early industrialisers. Their backwardness and the lack of entrepreneurship necessitated the intervention of the State as a 'substitutive factor', to use Gerschenkron's words. However, the role of the State in economic development has varied considerably, ranging from the simple protection of the domestic market through tariffs to the creation of large state companies. In general terms, we can say that the later the industrialisation process of a country took place, the greater the role of the State in economic development.<sup>1</sup> Although Italy and Spain shared common characteristics around 1880, namely an industrial and economic backwardness with respect to the more advanced

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European countries, large regional differences and poor endowment factors, particularly in terms of coal resources, the role of the state in the industrialisation process was very different in the two countries. The undeniable prominence of the private initiative and the limited role of the State in the Spanish case contrasted with the 'precocious state capitalism' of Italy which can be seen in its higher public spending, mainly in defence and public works together with the promotion of large industrial companies and their bailout when they encountered financial difficulties.<sup>2</sup> As a result, the economic development models of the two countries were very different, which was reflected in the evolution of the steel industry.

The steel sector was chosen to analyse the development strategies of Spain and Italy for a number of reasons. First, economic historians of both countries have frequently considered that the steel industry exemplifies the problems that the industrialisation process had to face. Second, from the end of the nineteenth century until recent times, the steel industry has constituted a strategic sector due to its role as a provider of raw materials for many basic industries and due to its importance in the production of war materiel and therefore in the defence of the nations. The sector is also highly capital intensive, which, since the introduction of procedures for the mass production of steel, has generated advantages derived from economies of scale. Consequently, a steel industry emerged characterised by high barriers to entry and a concentration of production through mergers and takeovers, giving it an oligopolistic structure. This facilitated the emergence of cartels and other forms of collusion after the end of the nineteenth century but did not prevent the entry of new competitors. As a result, significant imbalances arose which led to a reduction in profits and the need for major adjustments in the sector. Until the First World War, the general tendency of the European governments was to accept the collusive agreements between companies such as industry self-regulation mechanisms. However, this attitude changed after the war, giving rise to a strong increase in state regulation, in some cases leading to the direct participation of the State in the ownership of firms.

Although it is not easy to explain the reasons for the different strategies followed by Italy and Spain, we could venture, in accordance with Milward, that military and political unification were the most determining factors, more so than those relating to ideology or political regime.<sup>3</sup> Italy was a young nation which had emerged in 1861 after the unification of the different territories of the Apennine Peninsula. Its governments sought to bring cohesion to the territory in order to consolidate national unity by investing in public works, particularly in railways. It also aspired to reduce regional differences and to consolidate itself as a European power. Contrary to the vibrancy of the young Italy, Spain was an old empire whose disintegration would culminate in 1898 with the loss of the Philippines and the remains of its American empire (Cuba and Puerto Rico). This plunged the country into a serious crisis of national identity and a relative isolation from international politics which undoubtedly influenced the low public and military spending and, consequently, the lower capacity of the State to promote industrial development. From the perspective of Development Economics, the history of the two countries has shown that the economic upturn of the late industrialisers did not imply that the State necessarily assumed the leading role of the industrialisation process, nor that its policies would inevitably lead to success. As pointed out by Lin and Nugent, "the state can fail not only if it does the wrong thing but also if it does too little or too much about the right thing".<sup>4</sup>

In general terms, it is considered that in Italy, the state support gave rise to a rapid yet chaotic growth of the sector as the large investments made from the end of the nineteenth

century were often speculative and did not sufficiently address the technical and organisational aspects. The difficulties of the sector and its strong ties with the principal mixed banks forced the State to intervene in order to rescue and restructure it in 1911. Further bailouts in 1921 and 1931 confirmed the essential role of the State in substituting the weak business factor. The Italian case also exhibited a failed entrepreneurial and business initiative and the limited capacity of state intervention to resolve the 'Italian steel problem' (understood as the absence of a competitive steel sector, with the concentration of production in large integrated coastal plants).<sup>5</sup> As a result, the prices of steel products would have been higher in the domestic market than abroad, imposing high costs on the user industries of steel, and on the Italian economy as a whole.<sup>6</sup>

In the case of Spain, the most widespread hypothesis maintains that from the end of the nineteenth century Spanish businessmen were more liable than their European counterparts to implement rent-seeking strategies. This would be due to the institutional framework established during the Restoration (1876–1931), which created a perverse incentive structure for the country's economic development.<sup>7</sup> Following Baumol's theory of allocation of entrepreneurial resources, it has been argued that the rules of the game of this period encouraged the emergence of lobbies and collective action, especially in oligopolistic sectors that gave priority to unproductive activities (rent-seeking) over productive activities (innovation).<sup>8</sup> The collective action of the steel companies was mainly directed at obtaining tariff protection for their products and for the steel-using industries, which they achieved in 1891. Tariff protection enabled them to carry out a self-regulation of the market through cartels and other forms of cooperation without interference from the State. It is generally agreed that these practices restricted the entrance of new competitors and delayed technological innovation, giving rise to slow growth in the sector and a rigid supply of steel products.<sup>9</sup>

The objective of this study is to compare and contrast the economic development models of the two countries in the late nineteenth and early twentieth centuries through the study of the steel industry. More specifically, it will evaluate whether the early presence of the developmental state in Italy constituted an advantage for its economic development, as opposed to the Spanish model, characterised by the leading role and the self-regulation of the private initiative. The first two sections following this introduction analyse the development of the Italian and Spanish steel industries from 1880 until 1929, with particular emphasis on the role of the State and its influence on business activity. A quantitative comparison of the results of the two strategies in the steel industry is made in the third section, and an attempt is made to explain what could have been the causes of the slower development of the sector with respect to those of the early industrialisers. The final section draws conclusions about the lack of entrepreneurship and the role of the State in economic development.

## Steel and state capitalism

Italy entered the steel age in the mid-1880s, when the first Martin-Siemens furnaces were adopted for manufacturing steel. Until then, the steel industry, concentrated in Padania, had been characterised by its small size and limited production: In 1881, 94,941 tonnes of wrought iron, 3630 tonnes of steel and 27,800 tonnes of pig iron were produced.<sup>10</sup> The technological delay in the sector was significant compared to other western European countries as all the pig iron production was obtained with charcoal blast furnaces and most of

the wrought iron corresponded to the so-called *ferro-pacchetto*, obtained through the refining of scrap in traditional furnaces.<sup>11</sup>

From the mid-1880s, government action to promote the industrialisation process placed special emphasis on the integrated steel industry which the majority of the ruling class considered essential in order to guarantee its success. The measures adopted during these years in order to promote the sector included the protectionist tariff of 1887, the quotas for Italian machinery with respect to orders for railways, the support given to national shipyards and the advantages obtained by Italian steelmakers in using iron ore from the island of Elba.<sup>12</sup> As has been noted by Amatori (2010), the prominent role of the State in Italy's economic development after the Unification led to the emergence of a kind of entrepreneur whose activities were guided by the State's action, resulting in 'an evident confusion between patriotism and business'.<sup>13</sup>

One of these entrepreneurs was Vincenzo Stefano Breda, who was appointed by the government to build Italy's first modern steelworks, through the creation of the Società degli Alti Forni, Fonderie e Acciaierie di Terni, which put the first Martin Siemens furnaces of the country in operation in 1884. This initiative was considered the most relevant state action to promote the steel industry. The government not only supported the project, but also directly participated in its financing through an advanced payment for an order of armoured sheet metal for the navy. According to Zamagni, this represented 'the first of a long series of acts of state intervention aimed at guaranteeing the country a basic steel industry'.<sup>14</sup> Three years after its creation, the Terni found itself in serious debt and on the verge of bankruptcy due to the technical difficulties in producing armoured sheet metal and the growing capital needs to finance investments that were much more costly than initially thought. There was also the problem of the location of the factory in Umbria, far from sea for defence reasons, resulting in high transportation costs. The collapse of the company could only be avoided through a 'rescue operation', the first to be carried out by the Italian State to sustain the steel sector and at the same time to avoid the bankruptcy of the financial institutions that were heavily involved in financing it.<sup>15</sup>

In the years following the rescue of Terni and during the Giolitti years (1901–1914), public expenditure rose to 16–18% of GDP, due mainly to a high investment in public works and an increase in the Government's military spending. The high public demand – which, in 1911 accounted for about one-third of total metallurgical production – facilitated the emergence of new companies that would be responsible for the modernisation of the Italian steel industry in the years leading up to the First World War.<sup>16</sup> These included Ligure Metallurgica (1890), Alti Forni e Fonderie di Piombino (1897), Società Elba (1899) and Siderurgica di Savona (1900). The Società Elba constructed blast furnaces on the island of Elba and in 1902 obtained the first coke pig iron in Italian history. The company Piombino constructed Italy's first integrated steel works on the Tuscan coast.

The creation of the new companies was possible thanks to the financial support of the two principal Italian universal banks, Credito Italiano (Credit) and Banca Commerciale Italiana (Comit). In 1903, the latter sponsored a collaboration agreement between Terni, Elba, Siderurgica di Savona and Ligure Metallurgica, constituting the so-called "steel trust", also known as the "Terni trust" due to the undeniable leadership of this company.<sup>17</sup> The agreement was reinforced in February 1905 when the companies belonging to the trust decided to construct a new firm, Ilva, in order to build an integrated plant in Bagnoli, taking advantage of the financial and fiscal benefits offered by the special law of 1904 for the industrial



development of the area of Naples. Only two of the large companies created during these years, Piombino and Ansaldo, were not involved in this horizontal integration led by Terni and the Comit. On the other hand, the existence of the trust did not prevent the emergence of new initiatives in the sector, which eroded the trust's market: at least ten new companies were established between 1904 and 1907 including the Società Anonima Acciaierie e Ferriere Lombarde (AFL), founded in 1906 by Giorgio Enrico Falck in order to construct the Sesto San Giovanni steelworks in Milan, and Tubi Mannesmann in Dalmine, a joint-venture established in the same year with German capital.<sup>18</sup>

In general terms, the state support in Italy is considered to have given rise to a rapid yet chaotic growth of the sector as the large investments made from the end of the nineteenth century were often speculative and did not sufficiently address the technical and organisational aspects. The large investments in the sector caused the companies to become heavily indebted which the mixed banks had no problems in supporting until the financial crisis of 1907. In November of that year, the financial difficulties led the companies of the Terni trust to request the prime minister, Giovanni Giolitti, to authorise the intervention of the Banca d'Italia in order to provide them with liquidity through discount notes. The difficulties of the sector and its strong ties with the principal mixed banks forced the State to intervene in order to rescue and restructure it. The action of the central bank went beyond providing the trust with the economic resources that it required, and began to work on a rationalisation plan for the sector which the companies were forced to accept in mid-1911 due to the worsening of the financial situation. The plan, negotiated between the companies, the mixed banking system and the Banca d'Italia, gave rise to the industrial and financial restructuring of the Terni trust, renamed as the Consorzio Ilva, and the constitution of a central sales system, the Ferro e Acciaio, which grouped almost the whole sector together.<sup>19</sup>

The key role played by the government and the Banca d'Italia in resolving the 1907 crisis shows that the Italian mixed banks were able to provide financial support for the strong industrial take-off because they directed their most risky commitments towards strategic sectors with the financial backing of the State, effectuating bail-out operations, where necessary.<sup>20</sup> Apart from its financial support, it is also important to highlight the role played by the State in the sector's restructuring by promoting, through the Banca d'Italia, the cartelisation of the steel market; something that was hitherto impossible to achieve because of the diversity of interests of the Italian steel sector.

It is difficult to assess whether the agreements of 1911 contributed to resolving the problems of the Italian steel industry, as the breakout of the war in 1914 represented, in Bonelli's words, 'a solution for all problems'.<sup>21</sup> The extraordinary benefits obtained from the increase in demand due to the war enabled companies to reduce their heavy bank debt which allowed private enterprises to break away from state control and mixed banks which had conditioned their development since the beginning of the century. In this respect, we can highlight the actions of Max Bondi, the owner of the Piombino factory who gradually took over the companies of the Consorzio Ilva and merged them in 1918, creating a new company, Ilva Alti Forni e Acciaierie d'Italia. The new firm also incorporated other companies acquired during the war engaged in a wide range of activities including mining (iron, lignite, magnesium, etc.), shipbuilding, car manufacture and mechanical construction as well as merchant fleet and electricity production.<sup>22</sup> Despite its size with 50,000 workers at the end of the war, it was evident that Ilva was a giant with feet of clay. In March 1921, the financial situation of the company was critical and a new bailout operation was required with the intervention of the

Banca d'Italia which granted a loan to prevent its bankruptcy. A consortium led by the main mixed banks (Comit, Credit and Banco di Roma) gained control of the company after Bondi was forced to resign. From this moment, the ties between the company and the mixed banks became stronger and more complex, giving rise to a close relationship which would prevail until the nationalisation of Ilva at the beginning of the 1930s.<sup>23</sup>

In the 1920s, state intervention was not limited to the rescue of Ilva, but also new tariffs were introduced in 1921, providing comprehensive protectionism covering the entire range of agricultural and industrial production.<sup>24</sup> In any case, the decisive State intervention would not have been effective in resolving the 'Italian steel problem', understood as the consolidation of a competitive steel sector, through the concentration of production in large integrated coastal plants. In fact, in the 1920s, the opposite occurred: the Italian steel sector showed signs of an increasing duality. First, there was the large integrated steel industry, Ilva, which was promoted and sustained by the mixed banks with the collaboration of the Government and heavily dependent on state demand. On the other hand, there was the *siderurgia del rottame*, that is, a steel sector that had practically renounced the smelting process (blast furnace) to focus on refining, using scrap as the main raw material.<sup>25</sup> This was largely composed of small and medium-sized companies catering to private demand with no direct ties to the State or mixed banks. They produced steel mostly from imported scrap. A good example of this type of company is AFL founded by G. E. Falk, which, thanks to the advantages of the war, was able to sever its ties with the mixed banks and develop a production model based on the use of scrap and hydroelectricity and oriented towards private demand.<sup>26</sup> The economic situation of the 1920s particularly favoured the *siderurgia del rottame*, which experienced strong growth thanks to the increase in private demand, the fall in the international prices of scrap and the Tariff Act of 1923 which liberated scrap imports and reduced the tariffs on pig iron. As a result, the imports of scrap grew from 326,000 tonnes in 1913 to an annual average of 855,000 tonnes in the period 1925-29, while the production of pig iron during the same period was 534,00 tonnes as opposed to 427,000 tonnes in 1913.<sup>27</sup>

Contrary to the boom in the *siderurgia del rottame*, Ilva experienced a continual loss of market share which fell from 61.3% of national steel production in 1913 to 32.1% in 1929. Consequently, its leadership in the sector was continually challenged by other companies such as AFL or Fiat, which hindered cooperative strategies to share the market.<sup>28</sup> After the closure of the central sales agency Ferro e Acciaio in 1918, the post-war crisis facilitated the constitution of a new association in 1922, Consorzio Ferriere Nazionali, which incorporated the majority of the country's producers. Although the annual renovations of the Consorzio enabled it to prevail until 1928, the conflicts between Ilva and AFL and Fiat were constant due to the desire of the latter two companies to increase their market share and on occasions the intervention of 'superior authorities' was necessary to resolve the conflicts. In October 1929, two new companies were created; the Consorzio Siderurgico Italiano and the Unione Siderurgica Italiana. The first was formed so as to carry out a rationalisation process of the steel facilities in an attempt to reduce production costs. The latter constituted a replacement of the central sales agency and was dedicated exclusively to the marketing of semi-products and the most common laminated products. However, the conflicts over market share continued, and AFL and Fiat threatened to abandon the new associations which prompted the intervention of Mussolini himself. The disputes between the leading companies were definitively resolved on 31 December when the government imposed compulsory syndicates for

steel products. Once again, in the same way as in 1911, the government had to intervene in order to enforce the cartel agreement, due to the different interests of the industrialists.

The most widespread view is that the support provided to Ilva by the government in order to maintain the cartels of the sector was offset by the failure of the company to reorganise its production structure in order to avoid the social conflicts that its closure may have caused. The organisational weakness of the company and its financial dependence on the mixed banks made it extremely vulnerable. The nationalisation of the major Italian banks in 1931 led, two years later, to the creation of a new state body, the Istituto per la Ricostruzione Industriale (IRI), which took control of Ilva. The difficulty in finding private buyers willing to acquire the industrial assets of the banks prompted the government to declare IRI a permanent institution in 1937 and, as a consequence, Ilva and other steel companies that had been acquired by the State were placed in a new public holding (Finsider). At this point, IRI controlled 77% of Italy's pig iron production and 45% of steel.<sup>29</sup>

### Spain: cooperative strategies and the limited role of the State

At the beginning of the 1880s, the Spanish steel sector, like its Italian counterpart, had still not entered the steel age. Steel production was concentrated in two regions of the Cantabrian coast: Asturias, which had large coal deposits, and Biscay, which did not have any coal beds but had a rich supply of iron ore deposits. Although the country had no shortage of coal resources they were of a poor quality. The coal was not suitable for steelmaking and, in general, was more expensive than British coal; therefore, the Biscayan steelmakers based their expansion on the consumption of local iron ore and coal from Britain, not Asturias. The most part of Spanish steel output was produced in vertically integrated factories which smelted the iron ore in coke blast furnaces and refined the pig iron in puddling furnaces. The output of pig iron in 1882 amounted to 125,981 tonnes, of which 95,546 tonnes were obtained in 14 coke blast furnaces, all in Asturias and Biscay. In the same year, 65,000 tonnes of wrought iron were produced, of which 60,000 were obtained in puddling furnaces. The remainder was obtained through direct processes which produced the wrought iron directly from the ore.<sup>30</sup>

During the middle decades of the nineteenth century, the Spanish steel sector experienced slow growth mainly because internal demand for steel products was satisfied with imports. Until 1891, steam engines enjoyed duty-free treatment and other machinery was subject to very low tariffs. The merchant navy was updated with ships purchased abroad thanks to duty-free access and the materials used for public works also enjoyed low import tariffs. Furthermore, the 1855 Railways Law permitted the free entry of all the materials necessary for the construction of the railways. Unable to capture the demand of the most dynamic sectors of the economy (it is estimated that in 1885 half of the steel products consumed in Spain came from abroad), the national producers were limited to serving a small and highly diversified traditional demand for which it was difficult to obtain economies of scale.<sup>31</sup>

From the beginning of the 1880s, the Spanish steel sector began a renovation process led by the Biscayan companies. With respect to financing, although the banks were not absent from the extension and modernisation processes of the Spanish steel sector, they did not play such a key role as the mixed banks did in Italy. In 1882, the old factory of Nuestra Señora del Carmen (1855) was transformed into the company Altos Hornos de Bilbao (AHB)

and began operating two Bessemer converters in 1886, which marked the beginning of steel production in Spain. In the same period, another two new companies were created, (San Francisco [1879] and La Vizcaya [1882]), which, drawing from the rich iron ore reserves in Biscay, built coke-~~free~~ blast furnaces to produce pig iron.

The new business initiatives and the technological renovation led by the steel industry based in Biscay gave rise to a strong increase in steel production. In a period of one decade, the production of pig iron practically tripled and that of wrought iron and steel increased two-and-a-half fold. The growing weight of steel in Spain's business fabric translated into a greater capacity to influence public administrations, which eventually led to a strategy of industrial growth based on import substitution. This policy was implemented in December 1887 when the Navy announced a tender competition for Spanish companies to supply most of the materials for the construction of six warships. This decision constituted sufficient stimulus for AHB, La Vizcaya and the Asturias-based company Duro y Compañía to install Martin-Siemens furnaces in order to manufacture steel.<sup>32</sup> Another warship building programme was not approved until 1907, which stimulated the emergence of a major ship-building company, the Sociedad Española de Construcción Naval. In any event, it is important to emphasise that, contrary to Italy, state demand in Spain was always very limited and never constituted a fundamental base for the development of the steel industry. Public expenditure represented only 10–11% of GDP from 1900 to 1913, with only 11% of the total allocated to public works as opposed to 30% in Italy.<sup>33</sup>

In fact, the main action of the State to promote the development of the steel industry was the establishment, in 1891, of a favourable tariff framework. For the first time in half a century, this framework offered high protection for metallurgical and engineering industries. However, it is important to note that the initiative for the protection of the internal market did not start with the government, but the steel companies themselves. In February 1890, practically all the companies in the sector came together to create the Asociación de la Industria Siderúrgica in order to defend their interests before the commission formed by the Government to study the tariff reform. Its primary objective was to achieve an increase in customs tariffs not so much for their products but for those of the industries that consumed them (metallurgical and metal mechanics), which they fulfilled thanks to the coalition with cereal producers and the Catalan textile industry. Although the association was dissolved once the tariff was approved, the steel companies maintained and even increased their lobbying capacity through a new organisation, the Liga Vizcaína de Productores, created in 1894, which also included metallurgical companies. In 1896, the new association succeeded in ending the tariff exemption which the railway companies had been enjoying since 1855, and played a relevant role in the design of the Tariff Act of 1906.<sup>34</sup>

The protection provided by the tariff of 1891 boosted the price agreements between the Spanish steel companies. These agreements were initially very unstable due to the differences between Biscayan and Asturian companies, as had been the case in the two preceding decades. However, in 1897 a cartel was established, the Delegación de Fabricantes de Hierro y Acero, which contemplated aspects such as common sales conditions, price-fixing, allocation of quotas and information exchange.<sup>35</sup> It is undeniable that the existence of a central sales system gave rise to a reduction in competition between the members of the cartel, but at the same time tariff protection and high cartel prices encouraged the entrance of new competitors which represented a problem for the Delegación de Fabricantes.<sup>36</sup> In 1904, the problems between the members of the cartel and the increased competition from

outsiders caused the leading company, Altos Hornos de Vizcaya (AHV) to separate from the cartel and start a price war in order to drive other producers out of the market.<sup>37</sup> Founded in 1902 as a result of the merger between three Biscayan companies (Altos Hornos de Bilbao, La Vizcaya and La Iberia), in 1904 AHV produced around 60% of the country's pig iron, 30% of merchant shapes and 50% of sheets, flat and structural shapes. The price war that broke out between the steel producers clearly showed that with its lower production costs and its market power, AHV was the leading company and the others could only act as price takers. The immediate consequence was the dissolution of the Delegación de Fabricantes. Nevertheless, at the end of 1906, all of the Spanish steel companies, except for a small factory in the Basque Country, accepted the conditions of the leading firm and united to form the Central Siderúrgica, a central sales agency which provided stability to the price agreements and the distribution of markets among the companies until the Spanish Civil War (1936–1939).<sup>38</sup> The high profits obtained thanks to the cartelisation of the market and its lower production costs enabled AHV to carry out an extensive plan of technological and organisational improvements which enabled it to almost duplicate its production between 1900 and 1913.

After the First World War, the State assumed a leading role in promoting the economic development of Spain. In addition to the traditional protectionist policy (with the new Tariff Act of 1922), Primo de Rivera's Dictatorship implemented an investment programme in public works between 1926 and 1929. According to Carreras and Tafunell (2003), the State undertook an active investment role on a scale that it had not played since the period 1856–1866.<sup>39</sup> Public spending represented between 13% and 14.5% of GDP between 1924 and 1929, similar to the levels of Fascist Italy (between 12.3% and 14.7% during the same period), and investments in public works represented between 15% and 25% of total government spending in both countries.<sup>40</sup> Although the public works programme of the dictatorship had a minimal impact on economic growth during the 1920s, the fact is that State demand contributed to strong growth in heavy industry, particularly in the steelmaking sector (see Table 1).

During the 1920s, the public works programme, tariff protection and social order, together with the high profits derived from cartel prices enabled the major companies to carry out ambitious programmes for expanding and modernising their facilities.<sup>41</sup> In 1919, AHV absorbed its main competitor in Biscay, the integrated factory of San Francisco, and resumed the renovation projects in its facilities that had been interrupted due to the difficulties in purchasing machinery caused by the First World War. Thanks to the new investments, the

 **Table 1.** Production of pig iron and steel (in thousands of tonnes) and steel production per capita (in kg).

	Italy			Spain		
	Pig iron	Iron and steel	Steel production per cap.	Pig iron	Iron and steel	Steel production per cap.
1880	17	92	3	85	49	3
1890	14	284	9	294	147	8
1900	24	325	10	310	203	11
1913	427	1076	31	425	316	16
1923	236	1219	32	400	476	22
1929	678	2122	52	749	1007	43

Sources: For Italy, Statistical Office of the European Communities, *Siderurgia. Anuario*, 1966, 234; for Spain, *Estadística Minera y Metalúrgica de España (EMME)*, 1881–1929, steel production per capita for Spain has been calculated with population data taken from Maddison Home page (<http://www.ggdcd.net/maddison/oriindex.htm>).



production of coke increased between 1913 and 1929 by 60%: that of cast iron by 46%; that of steel by 71% and that of rolled steels by 56%.<sup>42</sup> The rest of the companies in the sector also made investments during this period, but they were aware of the impossibility of competing with AHV. Instead of opting for mass production they chose to direct part of their production towards new market niches for products not included in the cartel.

The strong growth in domestic demand in the 1920s also enabled a new producer to enter the market, namely the Compañía Siderúrgica del Mediterráneo (CSM). This represented a radical change in the Spanish steel sector due to the scale and geographical location of this company. The CSM was founded in 1917 by Ramón de la Sota, a Biscayan businessman with mining and shipbuilding businesses, who wished to build a large integrated steel plant on the Mediterranean coast. Ramón de la Sota's project, which imitated the steel production model of the US, was to incorporate four blast furnaces, 10 Martin-Siemens furnaces and three rolling mill trains. Only the first phase of this huge project was developed which included two blast furnaces, five Martin-Siemens furnaces and three rolling trains, with a production capacity of 200,000 tonnes of pig iron, 260,000 tonnes of crude steel and 300,000 of rolled steel, making it Spain's second largest steel company after AHV. The first pig iron output from the blast furnaces was obtained in 1923 and a year later steelmaking was introduced.

From 1930, a downturn of the economic cycle began due not only to the effects of the international economic depression, but also because of the cancellation of the dictatorship's public works programme and the draconian budget cut. During the Depression, the republican regime, proclaimed in April 1931, maintained a pro-cyclical policy (with limited public expenditure), to the extent that when in July 1933, the CSM suspended payment to bondholders and stopped production altogether, the government simply placed an order for 25,000 tons of rails. This only served to maintain the activity of the plant and did not prevent the dismissal of 3000 of the 5000 workers in its workforce.<sup>43</sup>

In short, between 1880 and the beginning of the Civil War (1936), the Spanish State played a very limited role as a driver of industrialisation, with the exception of the public works programme implemented during the second half of the 1920s. However, the steel industry experienced significant growth, accompanied by a process of concentration, which led the two leading companies, AHV and CSM, to represent 63% of Spanish steel production and 77% of pig iron output in 1929 which was an important difference compared with the situation in Italy at that time.

### A comparison of the models

Having analysed the evolution of the sector in Italy and Spain, it is clear that, despite having some features in common relating to import substitution industrialisation through tariff protection, state intervention in both countries shows important differences. We now need to assess whether Italian state capitalism had any advantages over the Spanish model characterised by the prominence of private enterprise and a limited role of the State as a promoter of the industrialisation process. Table 1 shows that between 1880 and 1929, the results of the two models were quite similar, with strong growth in the steel industry, both in absolute and per capita terms. The role of public demand can be seen in the strong growth of the Italian steel production in the years prior to the First World War, reaching one million tonnes in 1910 and equalling Spain's output of pig iron three years later. The same can be said for

Spain in the 1920s, when its steel production doubled in only six years (1923–1929), reaching one million tonnes, mainly due to the increase in state demand for the public works programme of Primo de Rivera's dictatorship.

In terms of production, the Italian steel industry was slightly more dynamic, but the same cannot be said about its technological modernisation. The above-mentioned growth in production was due mainly to a major technological renovation, which meant the shutdown of puddling furnaces and the adoption of new technologies in steel making: the first steel converter was set up in Spain in 1886 and in Italy the first open-hearth furnace started operating in 1884. As we can see in Table 2, the technological renovation of the refining process in Spain was similar to that of Belgium or France: in 1895, steel production surpassed that of puddled iron; in 1905, the latter only represented 26% of total production and, in 1915, the puddled iron production was marginal. The substitution of traditional puddling furnaces with new techniques to produce steel was slower in Italy. Steel production did not surpass that of wrought iron until 1903, although the latter continued to grow until 1911. This was not the case for Spain, Belgium, France and Germany, where production of wrought iron began to fall after 1890.<sup>44</sup>

However, the main difference between the two countries lies in the production of pig iron. The vast majority of Spanish companies chose to produce their own pig iron in integrated steel plants, and after 1847 charcoal was replaced by coke in the iron ore smelting process. In 1907, the charcoal pig iron represented only 4% of total production. By contrast, in Italy, the first coke pig iron was obtained in 1902, with a notable lag behind the rest of Western Europe. Until then, most of the pig iron consumed in the country was imported, and national production was restricted to small amounts of charcoal pig iron, 160,690 tonnes of pig iron were imported in 1900 compared with a national production of 23,990 tonnes. From 1902, the rapid growth of domestic production made it possible for it to exceed imports in 1910, which, however, still remained very important (34% of national consumption in 1913 and around 20% in 1929).

In this regard it is particularly striking that the early and sustained support that the Italian government provided to large industrial groups generated much poorer results than in the Spanish case with respect to the development of integrated steel and the concentration of production. In 1929, the leading Italian company, Ilva, had nine production plants; it produced 410,693 tonnes of pig iron in the blast furnaces of Bagnoli, Piombino and Portoferraio and 579,276 tonnes of steel, two-thirds of which were obtained in the plants of Bagnoli, Piombino and Savona. Of these plants, only Bagnoli and Piombino were integrated plants. Ilva's production accounted for 57% of the domestic production of pig iron and 25% of steel. Apart from the Ilva plants, there was a third integrated steelworks in Servola, owned by the company Alti Forni e Acciaierie Venezia Giulia, which became part of Ilva in 1931.

**Table 2.** Production of puddled iron as a percentage of total production of wrought iron and crude steel.

	Italy	Spain	France	Belgium	Germany
1885	97	74	59	80	58
1895	77	43	53	56	21
1900	58	40	37	42	11
1905	43	26	28	29	7
1910	30	nd	17	17	3
1915	6	4	12	17	0
1925	6	3	0	4	0

Sources: Statistical Office of the European Communities, *Siderurgia-Anuario*, 1966, 238; for Spain, EMME, 1885–1925.

With regard to Spain, in 1929, the majority of the steel produced corresponded to the two large companies which had integrated plants located on the coast. The largest was Altos Hornos de Vizcaya, which, through a typical horizontal integration process, had incorporated the three principal steel companies in Biscay during the 1880s. Its production was concentrated in two integrated plants that were geographically very close and which had a joint output in 1929 of 415,135 tonnes of pig iron, 452,342 of steel and 315,585 of rolled steel, which was the equivalent of 55% of the country's pig iron and 45% of steel. In the same year, its main competitor, the Compañía Siderúrgica del Mediterráneo, produced 138,918 tonnes of pig iron and 181,391 of steel in its integrated plant of Sagunto, representing 22% and 18% of national production, respectively.<sup>45</sup>

Despite the rapid growth of production and the modernisation of their facilities, it is evident that the Italian and Spanish steel companies continued to lag behind the leading powers of Western Europe. This can be clearly seen in Table 3. The production, in per capita terms, of the two Mediterranean countries was about one fifth of that of Germany, France and Britain, and an enormous distance separated them from the US.

Many economic historians from both countries have tried to attribute this delay to the collusive behaviour of the steel entrepreneurs, placing particular emphasis on the terrible consequences of the cartelisation of the market. According to this hypothesis, the Spanish and Italian steelmakers would have found it more profitable to direct their efforts towards rent-seeking rather than improving their companies. The collusion between the State and the steel companies would have enabled the creation of cartels, preventing the lowering of prices of steel products which would have limited the development of consumer sectors.<sup>46</sup>

However, the behaviour of the Italian and Spanish steelmakers cannot be classed as unusual in the European context, given that this type of practice was commonplace in the majority of countries. The only significant difference was that, while in the other countries the business associations and the cartels were promoted by the companies in the sector, at least until the First World War, in Italy, the creation of the central sales agency, Ferro e Acciaio, in 1911 was promoted by the Italian government through the Banco de Italia, after the bailout of the steel trust. The many studies on business groups and cartels in Europe have found that the steel companies created groups in order to carry out a coordinated defence of their interests, particularly with respect to the seeking of protection against outside competition. Similarly, to the Liga Vizcaína de Productores in Spain, the German Verein Deutscher Eisen-und-Stahlindustrieller and the French Comité des Forges constituted industry associations for heavy industry companies obtaining domestic market protection, which increased when higher protection for the metal-mechanic industries was achieved. With regard to the

**Table 3.** Production of steel in different countries (in kg per capita).

	1880	1890	1900	1913	1929
France	47	46	64	127	236
Germany	50	75	139	265	284
United Kingdom	128	185	172	221	215
United States	80	122	174	350	471
Italy	3	9	10	31	52
Spain	3	8	11	16	43

Sources: Statistical Office of the European Communities, *Siderurgia. Anuario*, 1966, 236–237, *EMME*, 1900–29, and Barreiro-Zabala, *Estadística Minero-Siderúrgica*, 118–121.



cartelisation of the market, it seems that Spain and Italy were not the exception in Europe. The cartels, syndicates and *comptoirs* rapidly emerged in response to the difficulties experienced by the steel industry due to the international economic depression. From the 1890s, these agreements remained stable, not only because their actions were facilitated by domestic market protection, but also due to the favourable attitude of the public administrations. In 1904, the founding of the Stalhwertsverband constituted a landmark as it created a central sales system for the majority of the German steelmakers. It is highly likely that this cartel provided a model for the Spanish steel companies in constructing the Central Siderúrgica in 1907 and the Italians when they created the Ferro e Acciaio in 1911.<sup>47</sup>

Although the strategies adopted by the Italian and Spanish steelmakers were no different to those of their French and German counterparts, there were differences in the results of the market cartelisation. The high internal prices enabled French and German producers to set low export prices, facilitating the penetration of their products in foreign markets either through dumping or export subsidies, providing an exit for an output which was growing way above the levels of domestic demand. The cartels did not promote the export of steel products in Spain or Italy due to a lack of international competitiveness. This was because the steelmaking techniques of the Second Technological Revolution were not appropriately adapted to the factor endowments of the two countries, particularly with respect to the availability of suitable coals for producing metallurgical coke. In Spain, the use of national coal was not an option given that, apart from its low quality, its price at the pithead was much higher than British coal even with the additional transport costs and tariffs, at least until 1920 when the protection of national coal was increased.<sup>48</sup> Given the lack of coal deposits in Italy, we can assume that the costs of imported coal would have a similar impact on the competitiveness of its industry, particularly pig iron producers, which would explain its high imports of pig iron and scrap for steelmaking.

The lack of competitiveness of their products forced the Italian and Spanish steelmakers to limit themselves to serving their home markets; but the economic and industrial delay of the two countries meant that there was a low and highly diversified demand which was not compatible with mass production.<sup>49</sup> This would explain the clear predominance of Martin-Siemens furnaces in both countries and the scarcity of converters (see Table 4), which, on the contrary, constituted the prevalent technology in Germany and France. Thanks to the speed of the process, Thomas and Bessemer converters were able to produce very cheap steels although with a relatively low quality. Their production served a mass and standardised demand. On the other hand, the Martin-Siemens furnaces could manufacture all types of steel, thanks to the longer refining operation, and therefore, were more suited to markets with highly diversified demand. To sum up, the commitment to the Siemens-Martin furnaces

**Table 4.** Production of wrought iron and steel in Italy and Spain, 1921–1930 (annual averages in tonnes). [AQ20](#)

	Wrought iron	Steel			Total iron and steel
		Martin-Siemens	Electric	Converters and others	
Italy					
1921–25	77,939	1,023,810	168,944	1,066	1,271,759
1926–30	124,368	1,610,291	228,953	0,829	1,964,441
Spain					
1921–25	9,725	328,373	15,097	153,656	506,851
1926–30	4,635	549,893	15,365	231,639	801,532

Sources: ILVA, 352, and Nadal, *Atlas de la industrialización de España*, annex II.4.2.13.

as opposed to Thomas converters should not be interpreted as a sign of the backwardness of the Mediterranean steelmaking sector, but rather as the most appropriate technological choice for the characteristics of the domestic market.

The Martin-Siemens furnaces were also much more flexible than the converters in terms of their load composition. The converters ran almost exclusively on hot-metal charge, that is, pig iron obtained in the blast furnaces, implying that they could only be used in integrated plants. On the contrary, the Martin-Siemens furnaces could operate with different proportions of hot-metal, scrap and pig iron, and the charge depended more on the availability and price of these materials than technical issues. However, in any case, this was not a great advantage for the Mediterranean steel companies, because, as the case of Italy shows, the substitution of pig iron for scrap did not eliminate the dependency on exports for a key input in the steelmaking process. The increase in the production of steel in the 1920s caused a sharp rise in the demand for scrap to charge the Martin-Siemens furnaces. Given the low consumption of steel in Italy and the delay in its industrialisation process, not enough scrap was produced in the domestic market to supply the needs of the steel industry. Consequently, mass imports were required which reached 855,000 tonnes per year in the second half of the 1920s making Italy the world's leading importer of scrap (see Table 5).



## Conclusion

A comparison of the development of the steel sectors in Italy and Spain between the mid-1880s and 1929 leads to two conclusions about the lack of entrepreneurship and the role of the State as a substitute factor for it, which to a great extent could be extrapolated to the industrialisation process of the two countries.

The first conclusion is that the strong state support in Italy did not provide any substantial advantage over the Spanish model which was characterised by the leading role of private initiative and a self-regulation through cartels and trade associations. At the end of the 1920s, the size of the steel sector in relation to the size of its population was similar in both countries (55 kg of steel per inhabitant in Italy and 43.5 kg in Spain). The process of the concentration of capital and production was also very similar: the majority of output was produced by one large company with integrated plants; AHV in Spain and Ilva in Italy. These two companies arose from a horizontal integration process of the factories that had emerged since the 1880s, although the market power of AHV was greater than that of Ilva, as we can see in the different evolution of the two companies during the 1920s. Finally, the timing and the scope of the technological modernisation process was also very similar in the two countries. Given that at the end of the 1920s there were no significant differences between the steel industry in the two countries, and the fact that the Italian government had carried out three expensive rescue operations in twenty years, we can conclude, as G.E. Falck stated in the 1930s, that state-guided industrialism in the Italian case led to a waste of national resources.<sup>50</sup>

Furthermore, the study of the steel industry in Italy and Spain reveals that, contrary to the view that considers the sector as a paradigm of the problems of the industrial and economic development of the two countries, not only was there a significant increase in production, both in absolute and per capita terms, but there was also a process of technological modernisation together with a concentration of production in large companies. Nevertheless, neither the Italian nor the Spanish steel industries achieved a level of development comparable to that of the German, French or Britain sectors.

With regard to the second conclusion, the main reason why the two countries lagged behind the leading nations of Europe should not be sought in the role of the State as a driver of industrialisation or in a so-called lack of entrepreneurship. Similarly, to other European countries, the governments of Italy and Spain reserved a large part of the domestic market for national enterprises through tariff and trade policies. But this did not solve the real problem of the sector, which was that the technology that emerged during the Second Technological Revolution was not appropriate for the factor endowment of the two countries, particularly with respect to coal. This is the reason for the delay in the adoption of coke blast furnaces by Italian steelmakers and for the rapid dissemination of Martin-Siemens and electric furnaces, in both Italy and Spain, in sharp contrast with Bessemer and Thomas converters. In any case, the lack of good coking coal reserves led to high production costs which resulted in the lack of international competitiveness.<sup>51</sup> The inability to compete internationally added to the low domestic demand due to the economic and industrial backwardness of the two countries; an insurmountable obstacle to the development of the steel industry. With no possibility to export and with a narrow domestic market, state demand constituted the only option for growth, which was the case of Italy during the years leading up to the First World War and in the 1920s in Spain with the public works programme of the Dictatorship. However, as pointed out by Ranieri, state orders could not generate sustained demand over time and were limited to certain products (plates for ship building and rails), while the overall level of consumption in the domestic market remained low.<sup>52</sup>

The small size of the domestic markets is a common assertion among economic historians. However, many of them, both Italian and Spanish, believe that the problem was not so much one of demand but rather of supply and that if production had been concentrated in large integrated plants, following the model of the more developed countries, economies of scale could have been obtained which would have enabled steelmakers to lower the prices of steel products, stimulating the development of the steel-consuming industries. However, the duality of the sector, that is, the co-existence of one or two large integrated companies engaged in the mass production of standardised products together with smaller companies operating in specific market niches with technology designed to satisfy them should not be understood as a lack of entrepreneurship but as the capacity of the enterprises to adapt to the characteristics of the markets.

## Notes

1. Gerschenkron, "Notes on the Rate," 72–89.
2. The idea of the precocious state capitalism in Bonelli, "Italian Capitalism," 106; Amatori, "Growth via Politics," 116, has called the industrial bailouts as a truly original element of the Italian development model.
3. Milward, "Business and the State."
4. Lin and Nugent, 1995, vol. 3<sup>a</sup>, 2333. See also Chang, *Globalisation*, who has incorporated the historical perspective in the analysis of state intervention in economic development. [AQ2](#)
5. Carparelli, "I perché," 131; Amatori "Beyond State," 142.
6. Bonelli, *Acciaio*, x; Carparelli, "I perché," 136.
7. Valdaliso, "El espíritu," 138.
8. Baumol, "Entrepreneurship."
9. Fraile, *Industrialización*; Torres, "Funciones empresariales"; Tortella, "Prologo"; Carreras and Tafunell, *Historia Económica*; Houpt and Rojo, "El desarrollo."
10. Ilva, *Ilva Alti Forni*, 88, 348–353; A detailed analysis of the metallurgical industry in nineteenth-century Lombardy in Colli, "Legami di Ferro."

11. Mori, "La siderurgia italiana," 17–21. The steel process comprises two phases: the first is the fusion of the mineral with the coal (coke) in the blast furnace, the pig iron ingots obtained have very limited applications and therefore are subjected to the refining phase in Bessemer or Thomas converters or in Martin-Siemens furnaces (open-hearth furnaces), obtaining steel. Before the methods for manufacturing steel became widespread, the refining of the pig iron was usually carried out in puddling furnaces to obtain soft iron.
12. Cafagna, "Economic Development of Italy," 62–63; Zamagni, *The Economic History*, 95. AQ3
13. Amatori, "Determinants and Typologies," 21–22.
14. Zamagni, *The Economic History*, 166.
15. Bonelli, *Lo sviluppo*, 3–28; Amatori and Colli, *Impresa e industria*, 44–45; Amatori, "Determinants and Typologies," 21.
16. Zamagni, *The Economic History*, 160–166; Mori, "L'industria dell'acciaio," 47.
17. In 1905 the Ferriere Italiane was incorporated into the steel trust. This company was founded in 1880 and had a shareholding in the company.
18. Bonelli, *Lo sviluppo*, 90–92; Carparelli, "I perché," 140–143; Mori, "Industria dell'acciaio," 34–40.
19. Cerioni, "La Banca d'Italia," 11–18; Mori, "L'industria dell'acciaio," 45–46.
20. Bonelli, "Italian Capitalism," 29; Amatori, "Italy's Futile Search," 141.
21. Bonelli, *Sviluppo di una grande impresa*, 113–119.
22. Ilva, *Ilva Alti Forni*, 93; Amatori and Colli, *Impresa e industria*, 119–121.
23. Ilva, *Ilva Alti Forni*, 94; Carparelli, "I perché," 27–35; Zamagni, *The Economic History*, 225, 297–298.
24. Zamagni, *The Economic History*, 229.
25. Bonelli, "La siderurgia"; Carparelli, "I perché," 86–116; Amatori, "Italy," 254–259, 274; Amatori and Colli, *Impresa e industria*, 48–50; Mori, "La siderurgia italiana" and "Industria dell'acciaio."
26. Pozzobon, "L'industria," 178–186; Ranieri, "Factores nacionales," 403–404; James, *Family Capitalism*, 245–258.
27. Ilva, *Ilva Alti Forni*, 332, 348–349; Carparelli, "I perché," 35–42.
28. Fiat was a car producer that entered the Steel industry developing the typical process of backward vertical integration of a steel consuming company. Pozzobon, "L'industria," 195–196.
29. Carparelli, "I perché," 80–100; James, *Family Capitalism*, 248–250; Ranieri, "Iron and Steel," 182–184; Amatori, "Growth via Politics," 117–119.
30. *Estadística Minera y Metalúrgica de España*, 1882. AQ4
31. Nadal, *El fracaso*, 155–165; Fernández de Pinedo "Nacimiento y consolidación"; Bilbao and Fernández de Pinedo, "Artesanía e industria," 170–172.
32. Fernández de Pinedo, "Nacimiento y consolidación," 11–14; Fernández de Pinedo and Uriarte, "La siderurgia," 223–225.
33. Comín, "Prólogo," 16–24.
34. Fernández de Pinedo, "Nacimiento y consolidación"; Sáez García, "Aranceles e industria" and "No tan diferentes".
35. Sáez García, "Hacia un cártel perfecto", 138–147.
36. On the entry of new competitors in the turn of the century, see Sáez García, "No tan diferentes," 65–67.
37. Sáez García, "No tan diferentes," 66–67.
38. The Central Siderúrgica was dissolved in 1967, but after the Spanish Civil War (1936–39) it operated more as a business organisation to defend the interests of the sector and as a sales agency. One of the most noteworthy aspects of the 1906 agreement was the leadership of AHV with production quotas of 49% for merchant steels, 45% for beams and 56.4% for sheet and flat steels. Sáez García, "Hacia un cártel perfecto," 152–154.
39. Carreras and Tafunell, *Historia Económica*, 240.
40. Infrastructure spending (gross fixed capital formation) increased from 120 million pesetas in 1942 to 429 million in 1929. Comín and Díaz, "Sector Público," 942; Comín, "Prólogo," 24–27.
41. On the expansion and modernisation programme of AHV, see Sáez García, "No tan diferentes," 68–69; on the Asturian company Duro-Felguera, see Ojeda, *Duro Felguera*, 177–180; on CSM, Sáez García and Díaz Morlán, *El puerto*, 24–32.
42. González Portilla, "AHV" 345–350; Sáez García, "No tan diferentes," 68–69.

43. Sáez García and Díaz Morlán, *El puerto*, 34–41.
44. Ilva, *Ilva Alti Forni*, 352–353; *CECA, Iron and Steel*, 1966, 238. The Spanish statistics show a stagnation in the production of wrought iron at around 58,000 tonnes between 1886 and 1905 and a rapid decline in production in the following years. [AQ5](#)
45. *Estadística Minera y Metalúrgica de España*, 1929; Nadal, *Atlas*, 146–151; Sáez García and Díaz Morlán, *El puerto*, 230–231. [AQ6](#)
46. On Spain, see Fraile, *Industrialización*; Tortella, *El desarrollo*; Carreras and Tafunell, *Historia Económica*; Houpt and Rojo, "El desarrollo." On Italy, see Mori, "La siderurgia italiana"; Bonelli "La siderurgia "; Carparelli, "I perché."
47. On the Comité del Forges and the *comptoirs*, see Rust, *Business and Politics*; Desgranges, *Le Comptoir*; Freedeman, "Cartels and the Law"; Barbezat, "The Comptoir "; Smith, *The Emergence*, 315–324, 359–371. On the VDSEI and German cartels, see Feldman and Nocken, "Trade Associations"; Webb, "Tariffs "; Troesken, "A Note "; Fremling, "German Iron," 124–132; Wengenroth, *Enterprise and Technology*, 117–156. [AQ7](#)
48. Sudrià and Bartolomé, "La era del carbón," 78–84.
49. On the Spanish case, see Fernández de Pinedo and Uriarte, "La siderurgia."
50. Quoted by James, *Family Capitalism*, 257–258.
51. On the difficulties of the Spanish steel industry to adapt to the new technology in steelmaking in the nineteenth century, see Fernández de Pinedo and Uriarte, "La siderurgia."
52. Ranieri, "Factores nacionales," 401–402.

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## Note on contributor

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